

# Studies on species of Holarctic *Pardosa* groups (Araneae, Lycosidae).

## VI. On the identity of *Pardosa luciae* TONGIORGI with notes on *P. trailli* (O.P.-CAMBRIDGE) and some other species in the *P. nigra*-group

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**Abstract:** The identity of *Pardosa luciae* TONGIORGI, said to occur in the Swiss Alps, is discussed. It is argued that the description was based on a misplaced male palp of the Nearctic species *P. uintana* GERTSCH. Consequently, *P. luciae* is removed from current synonymy with the European species *P. trailli* (O.P.-CAMBRIDGE) which is known from Britain and Scandinavia (distribution mapped). Within the *P. nigra*-group of species, *P. trailli* (with *Lycosa camifex* COLLETT here placed as junior synonym), *P. eiseni* (THORELL), and *P. uintana* constitute a close group of species sharing a helical configuration of the apical part of the embolus. Characteristics of these species and of *P. giebelsi* (PAVESI), endemic to the Central European Alps, are illustrated.

**Key words:** Araneae, Lycosidae, *Pardosa*, *P. nigra*-group, taxonomy.

### Introduction

The *P. nigra*-group in the wolf spider genus *Pardosa* encompasses 15 species. The group has a Holarctic range. Five species occur in Europe, viz. *P. eiseni* (THORELL), *P. giebelsi* (PAVESI), *P. lasciva* (L. KOCH), *P. nigra* (L. KOCH), and *P. trailli* (O.P.-CAMBRIDGE). Of these, *P. eiseni* (northern Europe; also through Siberia), *P. giebelsi* (endemic in the French, Italian, Swiss, German and Austrian Alps), and *P. trailli* (Britain and Scandinavia) were once suggested to be of subspecific rank (JACKSON 1932) though the same author pointed out and illustrated the differences in the shape of their emboli. Two species are restricted to eastern Palearctic, viz. *P. lyrata* (ODENWALL) and *P. paramushirensis* (NAKATSUDI). Eight species (revised by LOWRIE & DONDALE 1981) occur in North America, none of them found outside of the Nearctic.

In 1966 *Pardosa eiseni luciae*, was described by TONGIORGI from a single specimen

which, according to the label, had been captured in the Swiss Alps. The validity of this subspecies has, however, been put in question. In 1981, R. MAURER searched in vain for additional specimens in Switzerland (MAURER & WALTER 1984). These authors concluded that the existence of this subspecies was to remain doubtful until additional specimens were found. The taxon is not mentioned in MAURER & HÄNGGI (1990). Examination of the material on which *P. eiseni luciae* was described led to a quite unexpected conclusion from the evidence put forth below.

In addition, comments (with illustrations) are given below on *Pardosa trailli* with which *P. luciae* [raised to species rank by ZYUZIN (1979)] was synonymized by WUNDERLICH (1984). For comparison, notes and illustrations are given on *P. eiseni*, *P. giebelsi*, and *P. uintana*.

## Material

### Depositories

BMNH	The Natural History Museum, London, UK
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA
NHRS	Swedish Museum of Natural History, Stockholm, Sweden
OXUM	Oxford University Museum of Natural History, Oxford, UK
ZMUB	Bergen Museum, University of Bergen, Bergen, Norway
ZMUN	Zoological Museum, University of Oslo, Oslo, Norway
ZMUU	Museum of Evolution (Zoology), Uppsala University, Uppsala, Sweden

Figure numbers in parenthesis after specified materials refer to the origin of specimens used for illustrations. For material of *P. trailli* see further below.

### Comparative material

*P. eiseni*. – Sweden. Lapland: 1 ♀ (F. BJÖRNSTRÖM, NHRS: Collectio THORELL, holotype). Torne lappmark: Abisko, 9.7.1930, 1 ♀ (Å. HOLM, NHRS), 9.–16.7.1975, 8 ♂ 1 ♀ (K. MÜLLER, NHRS) (Fig. 3, 9, 10); Abisko, Nissonjokk, 24.8.1969, 2 ♀, 10.9.1972, 1 ♀, 11.8.1973, 1 ♀ (T. KRONESTEDT, NHRS) (Fig. 15, 23, 24); Kiruna, 18.7.1900, 1 ♂, 22.6.1900, 1 ♀ (A. TULLGREN, NHRS); Rostonselkä plateau, 3.7.1935, 1 ♀ (N. BRUCE, NHRS); Kårsovaggejokk, 7.–21.7.1900, 7 ♀ (A. TULLGREN, E. WAHLGREN, NHRS) (Fig. 19); Riksgränsen, 28.7.1900, 1 ♀ (A. TULLGREN, NHRS); Tarrakoski, 5.8.1900, 1 ♀ (A. TULLGREN, NHRS); Vakkakoski, 26.6.1900, 3 ♀ (A. TULLGREN, NHRS); Vuorevarto, 29.6.1900, 1 ♀ (A. TULLGREN, NHRS). Lule lappmark: Håmojokk, 20.7.1961, 1 ♀ (O. KRONESTEDT, NHRS); Harrå, 18.6.1930, 1 ♂ (Å. HOLM, NHRS); Kvickjokk, 22.–23.6.1900, 2 ♀ (C. SKOTTSBERG, NHRS); Sarek, Mikkajokk, 18.7.1900, 2 ♀ (C. SKOTTSBERG, NHRS). Lycksele lappmark: Sorsele, 10.7.1921, 1 ♀ (C. B. GAUNITZ, NHRS); Storuman, 30.6.1948, 1 ♂ (H. SUNDBERG, NHRS). – Norway. Nordland: Riksgränsen, 28.7.1900, 1 ♀ (A. TULLGREN, NHRS). Finnmark: Karasjokk, 8.7.1955, 1 ♂ 6 ♀ (H. TAMBS-LYCHE, ZMUB); Pasvik, Holmfoss, 11.7.1955, 1 ♀ (H. TAMBS-LYCHE, ZMUB). – Russia. Magadan Area: Upper Kolyma, basin of Sibit-Tyellakh R., thin larch forest, c. 700 m asl, summer 1985, 4 ♂ 4 ♀ (Y.M. MARUSIK, NHRS), same locality, summer 1987, 3 ♂ (Y.M. MARUSIK, NHRS); Upper Kolyma, 147° 30'E 61° 40'N, Biological station "Kontakt", 7.–8.1987, 3 ♂ (S.P. BUKHALO, NHRS).

*P. giebeli*. – Austria. Vorarlberg: Lechtaler Alpen, Zürser See, c. 2200 m asl, 4.7.1963, 2 ♂ 4 ♀ (K. THALER, NHRS) (Fig. 11). Carinthia: Glockner road, Hochtor, c. 2500 m asl, alpine grassland fragments and screes, 11.8.1978–15.9.1979, 32 ♂ 3 ♀ (K. THALER, NHRS) (Fig. 4, 16, 20, 27). Tyrol: 1 ♂ 2 ♀ (W. KULCZYŃSKI ded., NHRS: Collectio THORELL) (Fig. 28). – Switzerland. Tessin: 1 ♀ (P. PAVESI ded., NHRS: Collectio THORELL). Graubünden: Pontresina, 5900–6500 ft asl, 7.1900, 1 ♂ 6 ♀ (G. C. CHAMPION, BMNH).

*P. uintana*. – Canada. British Columbia: 17.5 km S. Sikianni R., Alaska Highway, spruce/pine forest, 31.5.–8.7.1981, 10 ♂ 3 ♀ (C. D. DONDALE, NHRS) (Fig. 1, 5, 6, 22). Manitoba: South Indian Lake, 29.7.1977, 6 ♀ (M. COLLINS, NHRS) (Fig. 17, 21). – USA. Colorado: Rocky Mountain National Park, 11,400 ft, 7–21.7.1967, 2 ♂ 1 ♀ (R. SCHMOLLER, NHRS).

### On the identity of *Pardosa luciae* TONGIORGI 1966

TONGIORGI's (1966) description of *P. eiseni luciae* was based on a single male which is preserved in MCZ. The vial also contains four females which TONGIORGI could not distinguish from those of *P. giebeli*, and in this I agree with him after studying the material. According to the labeling, the material was collected in the Swiss Alps.

The holotype male palp agrees well with fig. 22 in TONGIORGI (1966). It is not clear whether this left palp was once separated from the male preserved with it because the palp had been placed separately in a microvial and the right palp is missing. WUNDERLICH (1984) found that TONGIORGI's illustrations were clear enough for placing *P. luciae* as a synonym to *P. trailli*. However, after examining the holotype palp of *P. luciae*, and comparing it with various species, I found it to be identical with that of the Ne-arctic *P. uintana* GERTSCH. The protrusion on the convex edge of the distalmost helical part of the embolus (Fig. 6, arrow) is characteristic for *P. uintana*. This is discernible already in TONGIORGI's fig. 22 and illustrated in DONDALE & REDNER (1990, fig. 135) but not in LOWRIE & DONDALE (1981, fig. 7). Remarkably enough, TONGIORGI (1966: 290) mentioned that he had examined several specimens of *P. uintana* from the United States. This confusing result prompted some further insight around the material.

The type locality of *P. luciae*, as given by TONGIORGI (1966), was precise even to meter of altitude, but the collector's name was not given. It turned out that the vial containing the holotype and the four females originated from the collection of J. H. EMERTON. The vial contains two labels in pencil saying „Faulhorn“ and „*Lycosa blanda*? Faulhorn“ as well as a third saying „*Lycosa blanda* C. L. KOCH [Alps] Faulhorn (in Indian ink) J. H. Emerton Coll. (printed)“. There are more than one locality named Faulhorn in Switzerland, and TONGIORGI's reason for selecting the one near Brig in canton Valais is unknown to me. Another Faulhorn is situated in canton Bern and close to Interlaken where SCHENKEL (1918: 98) found *P. giebeli* to be common, and where MAURER (MAURER & WALTER 1984) searched for *P. luciae* but only found numerous *P. giebeli*.

We do not know how the male palp of *P. uintana* got into the actual vial. The vial may contain material which EMERTON collected in Switzerland during his stay in Europe in 1875–76 (where he travelled extensively: BANKS (1931, 1932, also through Switzerland: H. LEVI in litt.), or it may have been a gift from some European colleague collecting in the locality. The *P. uintana* male palp may have been placed in the vial by mistake during a later comparison between material of this North American species and the European *P. giebeli*. Furthermore, GERTSCH (1934: 17) synonymized the two names.

Why the vial bears the name „*Lycosa blanda*“ [*Pardosa blanda* (C. L. KOCH) is now placed in the *monticola* species group] may be understood from the taxonomic confusion during the last quarter of the 19th century, as can be elucidated from the following examples. *P. ferruginea* sensu SIMON (1937) and current concept was described by SIMON (1876) under the name *Pardosa blanda*. *P. giebeli* sensu SIMON (1937) and current concept was described by SIMON (1876) under the name *P. ferruginea* with *Lycosa giebeli* as a junior synonym. SIMON (1876: 350) indicated that he based his synonymy upon having seen PAVESI's type material of *P. giebeli* as well as material identified as *P. ferruginea* supplied by L. KOCH. Among material donated by L. KOCH to THORELL (in Collectio THORELL,

Swedish Museum of Natural History), there are two females labelled „*Lycosa blanda* C. L. KOCH/Germania/L. KOCH“, one of which is a *P. ferruginea* (L. KOCH), the other a *P. cincta* (KULCZYŃSKI) [probably those specimens mentioned as *P. blanda* by THORELL (1872: 295)]. Moreover, two females labelled „*Lycosa ferruginea* L. KOCH“ from Tyrol were sent to THORELL by L. KOCH, both being *Pardosa giebeli* (PAVESI) (see THORELL 1872: 303). Apparently L. KOCH sent specimens of *P. giebeli* identified by him as *P. ferruginea* to both THORELL and SIMON. This calls for a search and re-examination of the original material of *P. ferruginea* (L. KOCH) [not studied by TONGIORGI (1966)], which is outside the present study. According to KOCH (1870), the original material of *P. ferruginea* came from some different localities in the Carpathians (Tatra Mts.), the Bohemian Forest, the Bavarian and the Stubaier Alps. *P. giebeli* does not occur in the Carpathians or in the Bohemian Forest while both species occur in the Alps (THALER & BUCHAR 1996). KOCH's (1870) description of the epigyne fits at best its configuration in *P. ferruginea* as presently recognized.

*Pardosa uintana* has a wide distribution in the boreal zone, from Alaska to Labrador, also occurring in arctic tundra. It occurs at higher altitudes, even alpine conditions, southwards to Utah and Colorado in the west and Maine and New Hampshire in the east (LOWRIE & DONDALE 1981).

**Concluding synonymy:** *Pardosa luciae* TONGIORGI, 1966: 290–291 = *P. uintana* GERTSCH, 1933: 27.

### ***Pardosa trailli* (O.P.-CAMBRIDGE)**

(Fig. 2, 7, 8, 12, 14, 18, 25, 26, 29)

*Lycosa trailli* O.P.-CAMBRIDGE 1873: 524, pl. 46, fig. 1 (♂♀, only ♀ illustrated). 1 ♂ 2 ♀ from Scotland, Grampian, Braemar (labelled in pencil by O.P.-CAMBRIDGE „*Lycosa Trailli* Cambr. Braemar“) are apparently syntypes, in OXUM, examined. Lectotype ♂ here designated. This invalidates earlier neotype designation by LOCKET (1964).

*Pardosa trailli*: ROEWER 1954: 174 (*trailli*); LOCKET & MILLIDGE 1951: 270, figs. 131 A, D (♂♀); BONNET 1958: 3427; WUNDERLICH 1984: 437, figs. 40–41 (♀); ROBERTS 1985: 134, fig. 60a (♂♀); PLATNICK 2003 (excl. *luciae*).

*Lycosa carnifex* COLLETT 1876: 235–237 (♀).

Holotype: ♀ from Norway: Hedmark, Solli,

Fig. 1–4: Distal part of embolus (emb), terminal apophysis (tl.ap) and conductor (cond) in left male palp. 1: *Pardosa uintana* GERTSCH. 2: *P. trailli* (O.P.-CAMBRIDGE). 3: *P. eiseni* (THORELL). 4: *P. giebeli* (PAVESI). Scale line 120 µm (all same magnification).

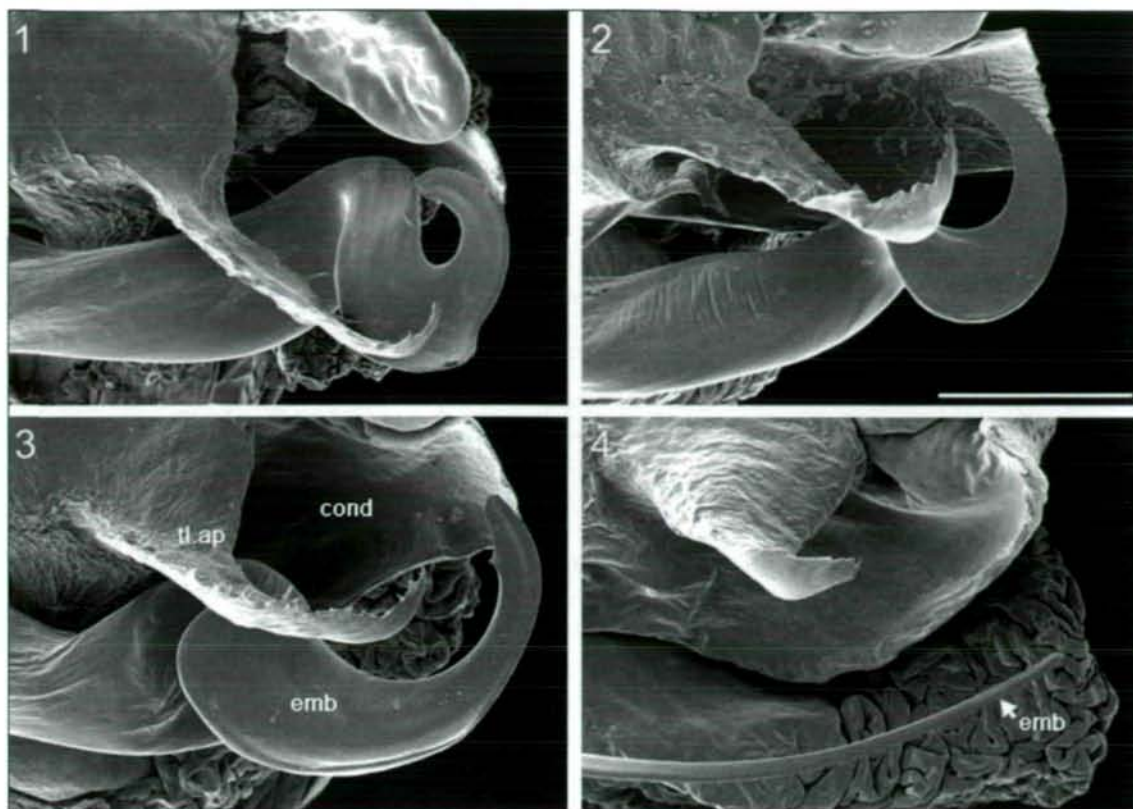
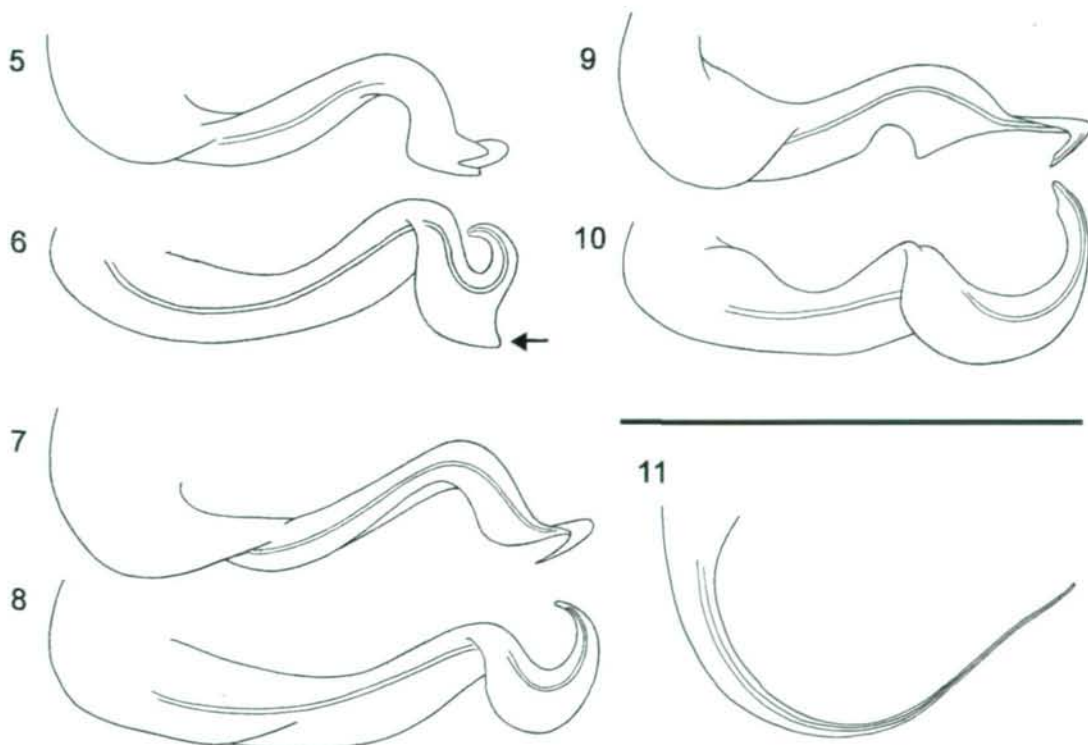


Fig. 5–11: Embolus of left male palp in frontal (5, 7, 9) and ventral (6, 8, 10, 11) view. 5, 6: *Pardosa uintana* GERTSCH. 7, 8: *P. trailli* (O.P.-CAMBRIDGE). 9, 10: *P. eiseni* (THORELL). 11: *P. giebeli* (PAVESI). For arrow see text. Scale line 0.5 mm (all same magnification).



in ZMUN, examined. TAMBS-LYCHE (1940) erroneously synonymized *L. carnifex* with „*Pardosa trailli eiseni*“. PLATNICK (2003) followed TAMBS-LYCHE when listing *P. carnifex* as a synonym to *P. eiseni*. **Syn. n.**

*Pardosa carnifex*: ROEWER 1954: 160; BONNET 1958: 3363.

?*Pardosa eiseni* (probable misidentification): SCHENKEL 1925: 406, fig. 2.

**Comments.** The male is distinguished by the the distalmost helical part of the embolus being comparatively short with evenly rounded convex edge (Fig. 2, 8), different



from the shape in *P. eiseni* (Fig. 3, 10: distal-most part longer than in *P. trailli*) and *P. uintana* (Fig. 1, 6, arrow: convex edge of distal-most part with protrusion); for comparison, the throughout narrow embolus of *P. giebeli* is shown in Figures 4, 11.

The female shares the condition "pocket-like extensions of the lateral elevations in the epigyne" (Fig. 14, 18: arrow) with *P. eiseni* (Fig. 15, 19: arrow) and *P. uintana* (Fig. 13, 17: arrow) but differs from the latter two by the shape of the epigynal receptacles which are more tumid in *P. trailli* (Fig. 25, 26) compared with the elongate condition in *P. eiseni* (Fig. 23, 24) and *P. uintana* (Fig. 21, 22). Moreover, the narrow anterior part of the epigyne in *P. trailli* is comparatively straight and wide with a well-defined septal ridge (Fig. 14, 25, 26). In *P. giebeli* there are no lateral pocket-like extensions in the epigyne (Fig. 16, 20) and the copulatory tubes have a characteristic proximal loop (Fig. 28: arrow), already shown in KULCZYŃSKI (1916, pl. 2, fig. 72), not present in the other three species.

**Distribution** (Fig. 30): Wales, England (Cumbria), Scotland, Faroes (?), Norway, Sweden.

The distribution of *P. trailli* in Britain has recently been mapped by MERRETT (2002). The specimen from the Faroes identified as *P. eiseni* (SCHENKEL 1925), but most probably being a female of *P. trailli* (also HOLM 1980), cannot be verified as no preserved material has been found (see Acknowledgements). Subsequent investigations of Faroese spiders (BRAENDEGAARD 1928; BENGTON & HAUGE 1979; HOLM 1980) have failed to secure any additional material. The illustration of the epigyne in SCHENKEL (1925, fig. 2) is most likely from a female of *P. trailli* (e.g. straight, distinct septal ridge) rather than *P. eiseni*. 67 species of spiders have been found on the Faroes (BENGTON & HAUGE 1979) and the composition indicates a disharmonic (DOWNES 1988) fauna, probably with a relatively high turnover of species (BENGTON & HAUGE 1979). Therefore, it is uncertain whether *P. trailli* can be regarded as occurring permanently on the Faroes or only as an occasional immigrant.

Fig. 12: *Pardosa trailli* (O.P.-CAMBRIDGE), right male palp. Scale line 0.5 mm.

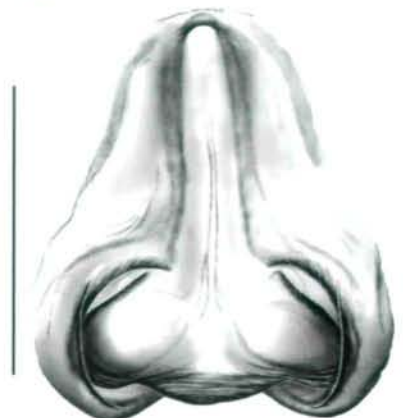


Fig. 13-16: Epigyne, ventral view. 13: *Pardosa uintana* GERTSCH. 14: *P. trailli* (O.P.-CAMBRIDGE). 15: *P. eiseni* (THORELL). 16: *P. giebeli* (PAVESI). Scale line 0.5 mm (all same magnification).

13



14



15



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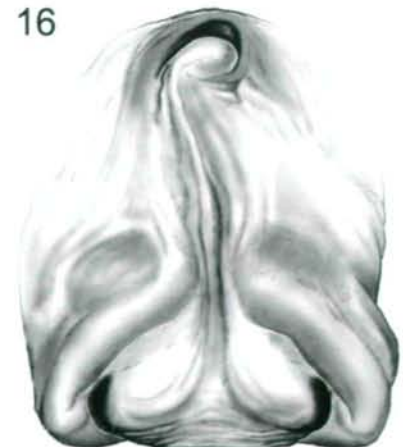
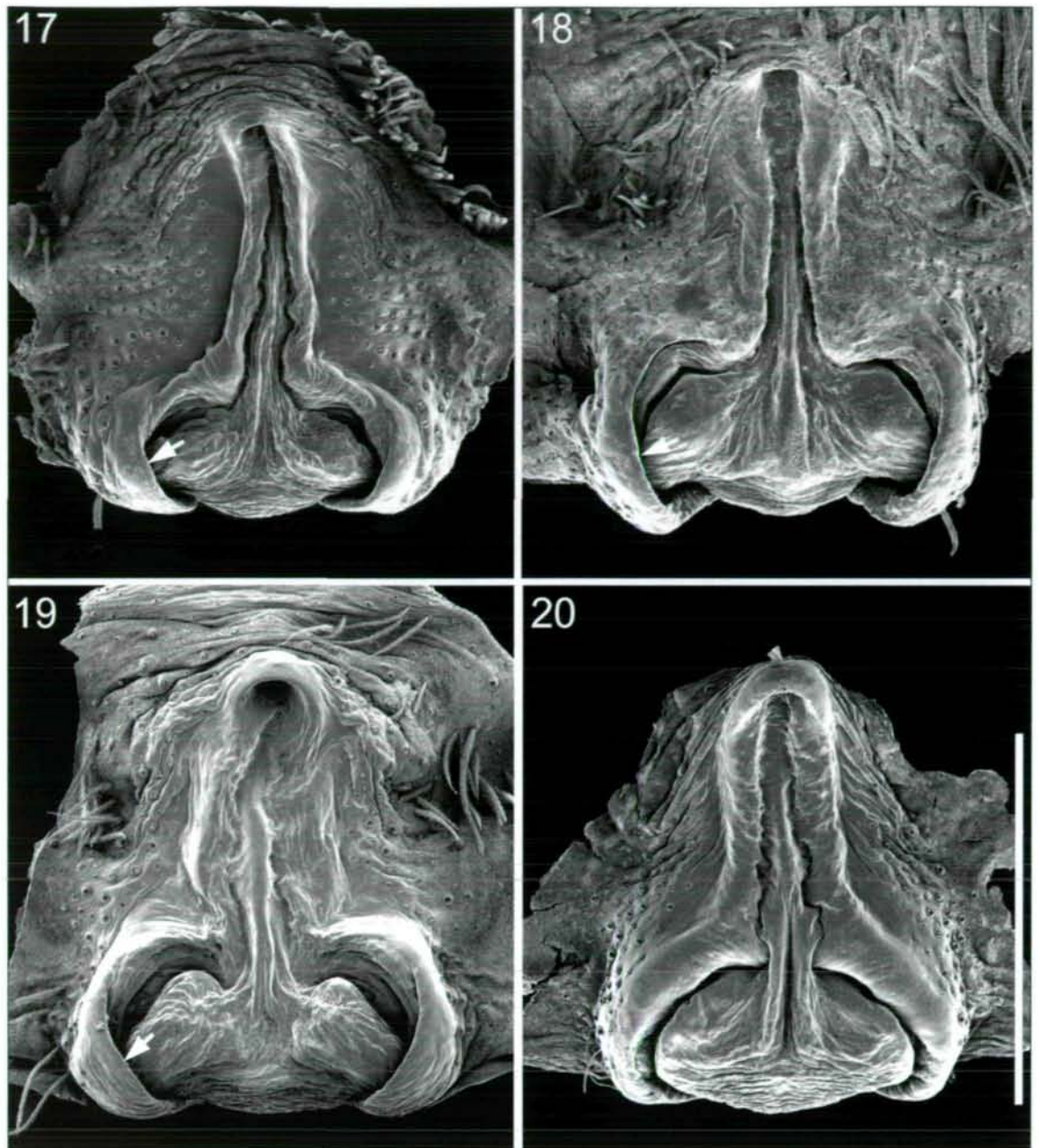




Fig. 17–20: Epigyne, ventral view. 17: *Pardosa uintana* GERTSCH. 18: *P. trailli* (O.P.-CAMBRIDGE). 19: *P. eiseni* (THORELL). 20: *P. giebeli* (PAVESI). For arrows see text. Scale line 600 µm (all same magnification).



The presence of *P. trailli* in S Norway was indubitably stated by HAUGE et al. (1978), earlier records in TAMBS-LYCHE (1940, sub *Pardosa traillii eiseni*) being a mixture of *P. trailli* and *P. eiseni*. When studying Norwegian material identified by TAMBS-LYCHE (in ZMUN) years ago, I found specimens collected in Varanger by R. COLLETT (Norwegian zoologist, 1842–1913, mainly known for his works on vertebrates) (? in Fig. 30 as no exact locality was given). As I had seen several specimens of *P. trailli* from the mountains of southern Norway and adjacent parts of Sweden, I suspected that this pair could have been missorted. Later, however, I identified specimens of *P. trailli* from

Magerøya, northernmost Norway, which verify the occurrence of this species also in the northernmost parts of that country.

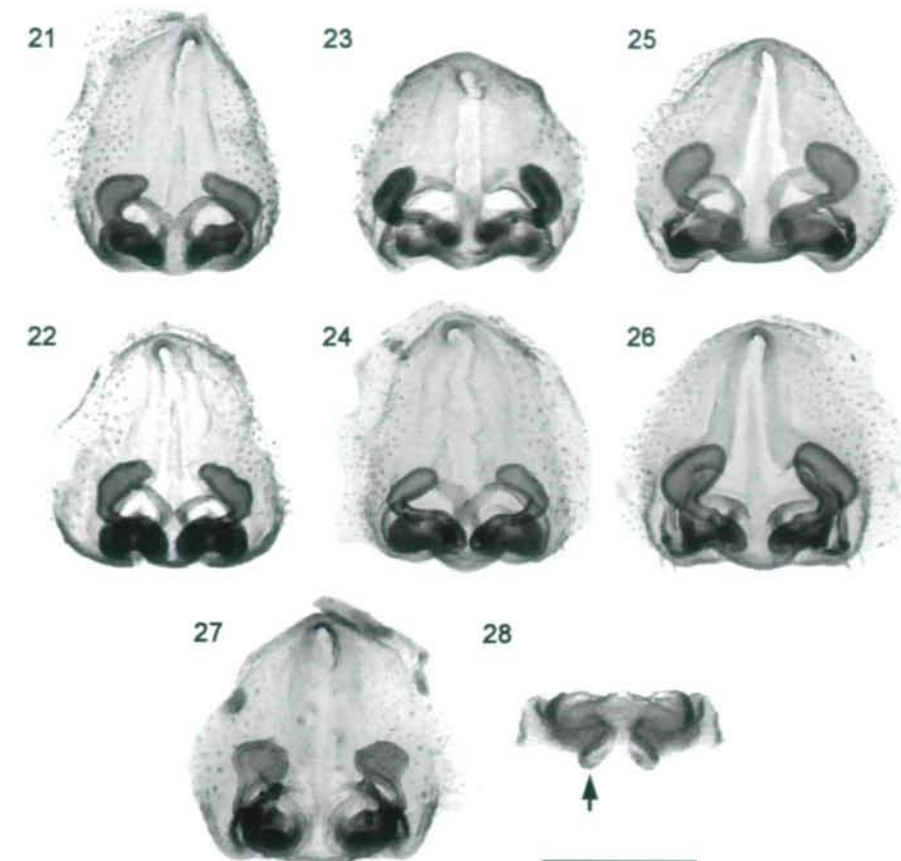
In Sweden, *P. trailli* has been met with on some mountains in the southern parts of the Scandes mountain chain where the species occurs in habitats with rock debris situated above timberline. [The first specified records of this species in Sweden are given below; the locality Skjolden in WUNDERLICH (1984) is situated in the province Sogn og Fjordane, Norway, not in Sweden as given.] Norwegian specimens found above timberline were collected on pioneer ground with sparse vegetation (when present) and



rich in stones (HAUGE et al. 1978; ØSTBYE et al. 1978). In Britain, this species is said to occur in mountains, especially on screes (LOCKET & MILLIDGE 1951), though the record from St. Kilda (MERRETT 2002) indicates that this is not a species exclusively occurring at high altitudes.

*P. eiseni* has a wide Palearctic distribution (cf. MARUSIK et al. 2000: map 148). It apparently has a wider ecological amplitude than *P. trailli*, occurring in various habitats above (e.g. alpine heaths) and below (e.g. birch and pine forests) timber-line, including sites with rock debris (cf. HOLM 1950; KOPONEN 1976). It is unclear how far to the south *P. eiseni* occurs in Scandinavia. In Norway, a single female from Oppland: Slidre (in ZMUN), a rather southern locality, was found to have an epigyne similar to *P. eiseni* (specimen mentioned by TAMBS-LYCHE 1940), but it proved to have been parasitized, probably by a mermitid nematode, and additional material is needed to verify the presence of *P. eiseni* in that area. In Sweden, *P. eiseni* has been found at least to southern Lapland [a record from Jämtland (HOLM 1947) could not be verified]. The record of *P. eiseni* from Mt. Hallingskarvet (Hardangervidda area, SW Norway) (COOKE 1967) is probably erroneous (? on Fig. 30) and was likely based on specimens of *P. trailli*. As the latter is widespread in the southern parts of the Scandes mountains, it remains to be found whether the few finds from northernmost Norway represent a disjunct occurrence. *P. trailli* should be searched for among rock debris (screes etc.) in interjacent mountainous parts.

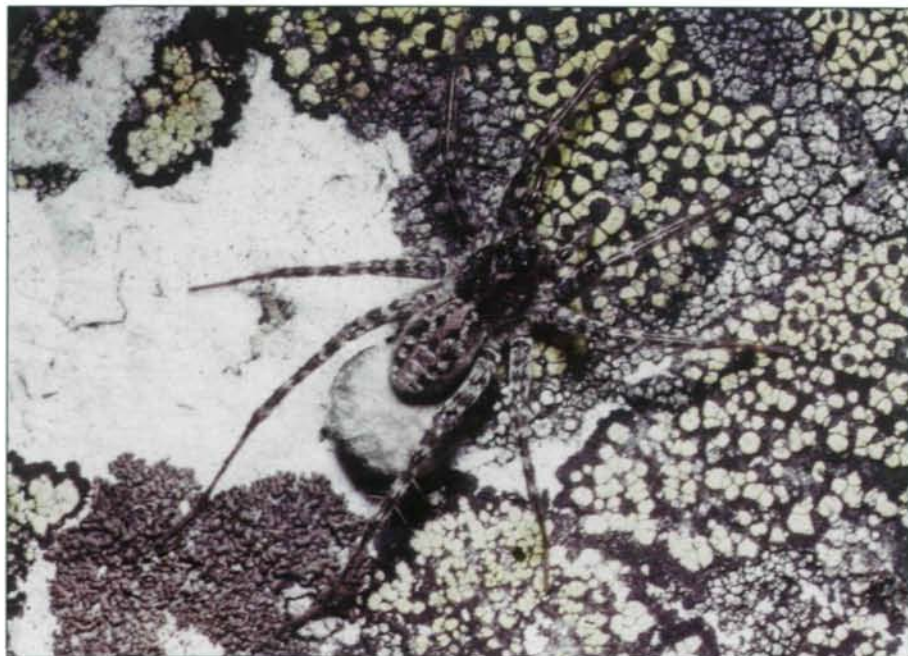
**Material of *P. trailli* examined.** Sweden. Dalarna: Idre, Mt. Nipfjället, 1.8.1928 1 ♀ [K. H. FORSSLUND, misidentified as *Lycosa eiseni* in HOLM (1934), in ZMUU]; do., 28.6.1978, 2 ♀ (T. KRONESTEDT, NHRS); Idre, Mt. Stadjan, 1130 m asl, 27.6.1978, 1 ♂ 3 ♀ (T. KRONESTEDT, NHRS). Härjedalen (all T. KRONESTEDT, NHRS): Linsäll, Mt. Hovärken, 1000–1100 m asl, 17.7.1960, 1 ♀, 17.–22.6.1975, 18 ♂ 12 ♀ (Fig. 2, 7, 8, 12, 14, 18, 25, 26); Hede, Mt. Sänfjället, 2.7.1979, 3 ♂ 6 ♀ (Fig. 29). – Norway. Telemark (without locality), 1 ♀ (ZMUN). Hordaland: Hardangervidda, several localities in Finse area, 1969–75, ♂ ♂ ♀ ♀ (B. BAKKE, E. HAUGE, ZMUB). Sogn og Fjordane: Gaupne, Stygevatn, 22.6.–14.7.1988, 1 ♀ (T. SOLHØY, ZMUB); Gloppen, Svartvatn, 1000–1200 m asl, 9.8.1946, 1 ♀ (G. WÄNGSJÖ,

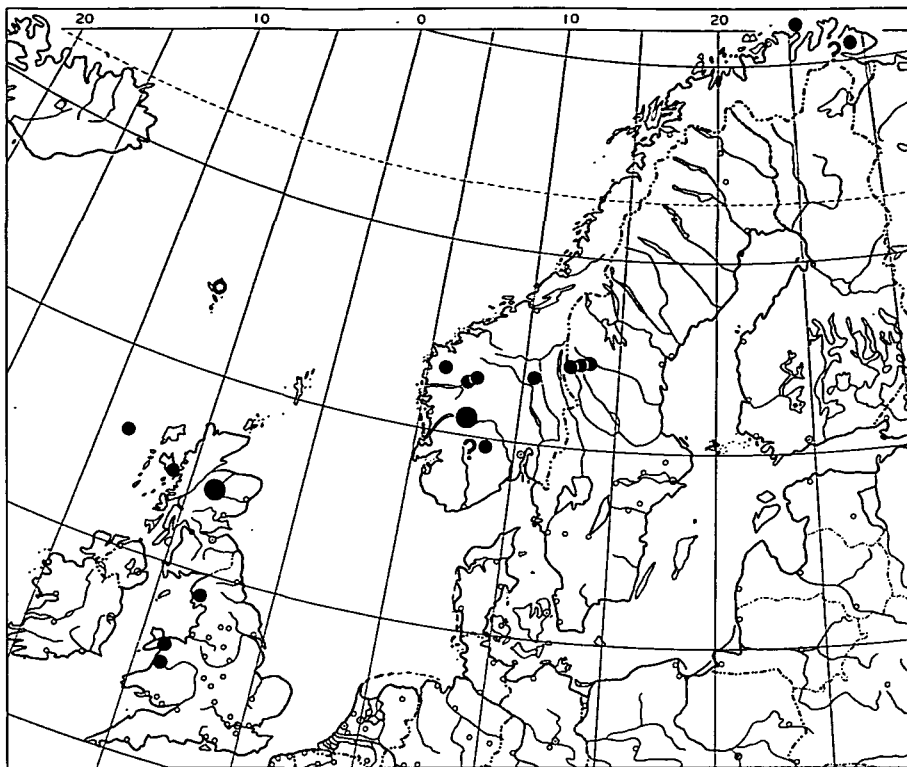


ZMUU). Oppland: Jotunheimen, Glittertind, 1890 m asl, 30.6.1956, 1 ♀ (Å. HOLM, ZMUU). Hedmark: Sollia, 1 ♀ (ZMUN), holotype of *Lycosa carnifex*. Finnmark: Magerøya, 4.7.1955, 2 ♀ (Å. HOLM, ZMUU); Varanger (without more exact locality), 1 ♂ 1 ♀ (R. COLLETT, ZMUN). – Scotland. Grampian: Braemar 1 ♂ 2 ♀ (OXUM; incl. lectotype). Western Isles: St. Kilda, Hirta, scree slope of Mullach Sgar, 21.6.1959, 1 ♀ (E.

Fig. 21–28: Epigyne, dorsal view (21–27), from behind (28). 21, 22: *Pardosa uintana* GERTSCH. 23, 24: *P. eiseni* (THORELL). 25, 26: *P. trailli* (O.P.-CAMBRIDGE). 27, 28: *P. giebeli* (PAVESI), for arrow see text. Scale line 0.5 mm (all same magnification)

Fig. 29: *Pardosa trailli* (O.P.-CAMBRIDGE), female with eggsac (body length 7.3 mm).





**Fig. 30:** Distribution of *Pardosa trailli* (O.P.-CAMBRIDGE). Large closed circles refer to the occurrence in more extensive high mountain areas (Norway: Hardangervidda; Scotland: the Caingorms and adjacent mountains). Open circle: questionable find on the Faroes. For "?" see text.

DUFFEY). – England. Cumbria: Keswick, 1 ♂ 1 ♀ (F. O.P.-CAMBRIDGE, OXUM). – Wales. Gwynedd: Snowdon, Crib Coch, 11 ♂ 7 ♀ [A. R. JACKSON coll., BMNH; vial with males labelled Snowdon only, but according to JACKSON (1924), he collected both sexes on 1.6.1919 on a scree bed on the side of Crib Coch]; Cadair Idris, c. 2150 ft., 10.6.1956, 10 ♂ (D. J. CLARK, BMNH)

### Final remarks

The species in the *P. nigra*-group share the following characteristics: in the male palp (1) a strongly protruding tegulum and (2) a slender terminal apophysis hanging free over the distal part of the embolus; in the female (3) an epigyne with narrow anterior furrow at least in part divided by a more or less defined septal ridge, terminating forwards in a single pocket, and posteriorly widening abruptly into broad septum occupying most of or the entire epigynal cavity.

The condition „helical tip of the embolus“ is shared by *P. eiseni*, *P. trailli* and *P. uintana*. Other species within the *P. nigra*-group have variously bent emboli (LOWRIE & DONDALE 1981, DONDALE & REDNER 1990) but none exhibits the configuration shared by these three species. The latter also share the condition „pocket-like extensions of the lateral elevations in the epigyne“ (Fig. 17-19, arrows).

In *P. giebeli*, the embolus is narrow and gradually tapering toward the tip. This reminds of the condition in some Nearctic species of the *P. nigra*-group, viz. *P. mackenziana* (KEYSERLING), *P. uncata* (THORELL) and *P. dorsalis* BANKS (LOWRIE & DONDALE 1981, DONDALE & REDNER 1990) though the curvature of the embolus is somewhat different. Moreover, the latter three species have a distinct loop in the proximal part of the copulatory tubes reminding of the condition in *P. giebeli* (Fig. 28, arrow; cf. LOWRIE & DONDALE 1981, figs. 49, 65; DONDALE & REDNER 1990, fig. 156).

Though the *P. nigra*-group has not been subject to any phylogenetical analysis, one may speculate about *P. eiseni*-*trailli*-*uintana* and *giebeli*-*dorsalis*-*mackenziana*-*uncata* being members of two different assemblages of vicariants (cf. e.g. PLATNICK 1976). If so, *P. giebeli* is not a species „mit Schwesterart [in this case: *P. trailli* + *P. eiseni*] im Nordareal“ (THALER 1992 and earlier papers, e.g. 1976). Both assemblages contain species with a wide west-east distribution in the coniferous belts of the Palearctic (*P. eiseni*) and the Nearctic (*P. uintana*, *P. mackenziana*), also passing the timber-line in mountainous areas. The rest of the species are more restricted in their distribution, occurring in mountainous areas (conifer forests and/or above timber-line: for *P. giebeli* see above, *P. dorsalis* and *P. uncata* in the Cordilleran region of western North America, for distribution see maps in LOWRIE & DONDALE 1981). PLATNICK (1976) pointed out that the time scale for vicariant patterns at the species level may be very extended, dating back to early Cenozoic or even earlier. Details in present distributions, however, can be due to comparatively recent events: *P. trailli* may have colonized southwestern Norway from Britain after the latest glaciation.

### Acknowledgements

I thank Dr. Lita Greve JENSEN and Dr. E. HAUGE (ZMUB), the late Dr. A. LILLEHAMMER and Mr. K. SUND, Zoologisk Museum (ZMUN), Dr. E. DUFFEY, Bussière-Poitevine, France, Mr. P.D. HILLYARD (BMNH), Dr. I. LANSBURY and Dr. M. J. SCOBLE (OXUM), Prof. H. W. LEVI (MCZ) and Dr. L. WALLIN (ZMUU) for information and loan of mate-



rial. No Faroese female identified by SCHENKEL as *eiseni* was found either in Zoologisk Museum, University of Copenhagen (Mr. S. LANGEMARK) or in Naturhistorisches Museum, Basel (Ms. Christine UNTERNÄHRER). I am indebted to Dr. C. D. DONDALE and Mr. J. H. REDNER, formerly Biosystematics Research Centre, Ottawa, the late Prof. Å. HOLM, Uppsala, Dr. Y. M. MARUSIK, Institute for Biological Problems of the North, Magadan, Dr. R. SCHMOLLER, earlier at University of Tennessee, Knoxville, and Prof. K. THALER, Zoologisches Institut der Universität, Innsbruck, for gifts of material; and to Dr. DONDALE, Ottawa, Prof. LEVI, and Prof. THALER for comments on various drafts of the manuscript. Special thanks go to Ms. Elizabeth BINKIEWICZ (NHRS) for her skilful drawings (Fig. 12–16).

## Zusammenfassung

Über Arten von holarktischen *Pardosa*-Gruppen (Araneae, Lycosidae). VI. Zur Identität von *Pardosa luciae* TONGIORGI, mit Anmerkungen zu *P. trailli* (O.P.-CAMBRIDGE) und einigen anderen Arten der *P. nigra*-Gruppe. Der Identität der angeblich in den Schweizer Alpen beheimateten Art *Pardosa luciae* TONGIORGI wird diskutiert. Da die Beschreibung auf einem falsch zugeordneten männlichen Palpus der nearktischen Spezies *P. uintana* GERTSCH basiert, ist *P. luciae* kein Synonym der aus Großbritannien und Skandinavien bekannten Form *P. trailli* (O.P.-CAMBRIDGE). Innerhalb der *P. nigra*-Gruppe bilden *P. trailli* (mit *Lycosa carnifex* COLLETT als jüngerem Synonym), *P. eiseni* (THORELL) und *P. uintana* eine Untergruppe nahestehender Arten mit einer helikalen Windung der Embolusspitze. Die Merkmale dieser Formen und der in den Alpen endemischen *P. giebelsi* (PAVESTI) werden abgebildet.

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